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and not accomplish its objects. The more extreme the character of the measure, the surer it is of non-enforcement."

"If organized labor takes a fair legal chance for prosecuting the grievances of individuals, it simply gives those individuals a fair chance before the law; if organized labor does not prosecute such grievances, it gives the employers an immunity from interference at present, but at the risk of almost revolutionary consequences in the future.

"There is nothing to prevent the knights of labor, or a trades-union, from being incorporated under the law of the state of Connecticut at present. Though not generally understood, this is a fact."

"Such legislation may help in raising the standard of the community. But let it be clearly understood that it is a rough process, and not a smooth one; that it frequently bears hardest where we should wish to see it bear least; and that it is hopeless to attempt to enforce it, until those whom it is designed to benefit—or, at least, a large part of them—have risen high enough to reap the benefit, and are sufficiently convinced of those benefits to use their own personal efforts for its enforcement."

The last portion of the report which we can mention is that which deals with the credit system. Professor Hadley discusses in order the practicability and the desirability of weekly payments and the best means of securing their enforcement. To most of his argument we give our hearty assent, though we think even more weight should be given to the objections to weekly payments advanced by certain manufacturers, who submit, that, from the very character of their work, its product cannot be properly estimated and paid for every week. We are glad, too, to see that Professor Hadley appreciates the fact that for the best employees weekly payments would be useless, and for the worst they would be worse than useless. The average workman is the one to be benefited by them. The report summarizes this discussion thus:—

"1°. The system of cash payment is a real advantage to the workman. 2°. The difficulties of weekly payment are not so great as is commonly supposed. 3°. But there nevertheless remain a sufficient number of cases to which a weekly payment law could not well be applied, to constitute a serious reason against making the system compulsory. 4°. The same general result could be reached more surely from another direction, by abolishing the factorizing process. This would necessitate a system of cash payments as a rule, and the exceptions to it would regulate

themselves in such a manner as to involve less difficulty. 5°. We therefore recommend that the legislature pass a law exempting the wages of all mechanics, journeymen, or laborers, from attachment for debt; with such additional legislation as may be necessary to prevent its effects from being evaded by the systematic assignment of wages on usurious terms."

With reports such as this of Commissioner Hadley, and those of Carroll D. Wright of the national and Massachusetts bureaus, before us, we can conscientiously commend the sagacity of Dr. Engel, one of the most eminent statisticians in Germany, and late chief of the Royal statistical bureau of Prussia, when he said that his ambition would be satisfied if he could accomplish in Germany the same work that was being done by some of the American statistical bureaus.

SEDGWICK AND WILSON'S BIOLOGY.

THE old and thoroughly vicious notion that "the power of repeating a classification of animals with appropriate definitions has any thing to do with genuine knowledge," is slowly disappearing before the advance of a rational method of teaching biology; namely, that of bringing the student face to face with the objects of his study. Much of this reform is due to Huxley and Martin's 'Elementary biology,' which appeared some ten years ago. In the book before us two of Professor Martin's former pupils undertake to elaborate and improve his plan of instruction, intending it to serve as a factor in general education or as "a basis for future studies in general biology, botany, zoölogy, or medicine."

After a general introduction, and chapters on the composition of living organisms, on protoplasm (which contains several pages on organic chemistry), and on the cell, then follow the long and very careful accounts of the bracken-fern and earth-worm, the typical examples selected of vegetable and animal life. The anatomical, physiological, and embryological aspects of the subject are (for an elementary work) treated with unusual fulness of detail. The authors have done wisely in not following Huxley and Martin's order of treatment, which begins with the unicellular organisms. This is the logical order, but it is beset with practical difficulties. As a matter of fact, most teachers will agree that beginners take most interest in, and succeed best with, forms which they are accustomed to see around them. The structure and functions of microscopic forms are really much more difficult for the beginner to

General biology. By WILLIAM T. SEDGWICK and EDMUND B. WILSON. Part i.: Introductory. New York, Holt, 1886. 8°

grasp than those of the higher animals and plants. On the other hand, if too differentiated types be selected, the mass of detail becomes somewhat embarrassing. One may doubt, however, whether the earth-worm is the best selection that might be made, on account of its small size and the rather skilful dissecting it requires. To those who do not accept the annelid origin of the vertebrates, its supposed central position and clear relation to the animals above it are not so apparent.

A novel and most valuable feature of this book is the attention devoted to physiology and embryology. This method of treatment will no doubt prove most attractive and stimulating to the student, as well as give him a much more just and adequate conception of the subject than is possible from anatomical methods alone.

As a whole, the work is excellently done, and the points to which one may wish to take exception are of minor importance. There is not quite enough distinction between fact and inference. For instance: while few naturalists reject the theory of evolution, it seems hardly in place in an elementary text-book. Huxley's example, in respect to matters of theory, is a good one. Then, too, the amount of physics and chemistry is somewhat unnecessary: if the student knows the elements of these sciences, it is superfluous; if not, it is insufficient. But these slight criticisms notwithstanding, we can sincerely congratulate the authors upon their work, and cordially commend it as a very valuable aid to teachers.

The publisher's share of the book is excellent as to print and paper, but the execution of the illustrations is not all that could be wished. Unfortunately this is a complaint that must very frequently be made of American scientific books.

ABBOTT'S UPLAND AND MEADOW.

THE author of 'Upland and meadow,' Dr. C. C. Abbott, tells us the secret of his success on the very first page. To him every half-acre is an inexhaustible zoölogical garden, every creature is companionable, amusing or instructive or both, and thus no ramble can be lonely, nor even the shortest walk through the tamest region uninteresting or uninteresting. But, like many other secrets, this is of little use to any except those fortunately to the manner born.

The relation between the author and his (generally feathered or furry) friends is not merely one of companionship, but of good-fellowship, comradeship. There is a sympathy between them. He continually tries to put himself in feeling in their

place, not only by his kindness, but by the practical jokes which he plays upon them (see pp. 76-79 and 209) and his keen enjoyment when they use the opportunity to laugh at him. The questions which he answers, and the experiments which he tries, are those which would occur to no mere anatomist or pure systematist, but only to one to whom all nature is in a certain sense akin, and who desires an *inside* view of it. And this, combined with a keen sense of the humorous and a command of a simple style and plain English, constitutes the great charm of the book.

We cannot but feel, however, that what he sees in the birds is often a reflection of his own keen humor; that he often transfers to their minds trains of thought which really exist only in his own; and that, while his observation may be entirely correct, his inferences from them are those of a warm friend rather than of an impartial judge. But one is disposed to pardon the author for this, especially while reading his pages.

The book is throughout a study of animal life, not of dead animals. It is a plea for the study of life-histories, of the habits, instincts, feelings, and thoughts of the common animals. It is a book which would encourage boys to observe, and give the young naturalist an introduction to a field for work unfortunately too sadly neglected by the present generation of scientific men. Why should not every one have a 'Poetquissings Creek'? Every one knows of similar streams, with their uplands and meadows teeming with a life of which we know practically nothing. It is hard to see how any one can read the bright and attractive pages of this book without making a firm resolve to observe more widely and carefully than he ever has before; and a book which will make boys and girls, and men and women, more observing is certainly doing the very best educational work. If love to being in general is the essence of virtue, we shall all certainly be the better for reading it. But the scientific man will also find in it much useful information, and many valuable observations of the occurrence and habits of some of our less known and studied animals.

ACCORDING to the *Lancet*, a new anaesthetic has been discovered in Australia. It is called drumine, and is obtained from the *Euphorbia Drummondii*. It is local in its action, and has certain advantages over cocaine, which is now so extensively employed for local anaesthesia. Its effects are as yet not sufficiently understood to warrant the acceptance of all that is claimed for it; but it will doubtless be investigated further, and its efficacy and value be more thoroughly established.